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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,523	07/19/2005	Koichi Tanaka	3712174.00455	3577

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EXAMINER	
SCULLY, STEVEN M	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
09/02/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary	Application No.	Applicant(s)	
	10/537,523	TANAKA ET AL.	
	Examiner	Art Unit	
	Steven Scully	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2010*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-15 and 19-29* is/are pending in the application.

4a) Of the above claim(s) *21-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-15,19,20 and 25-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FUEL CELL MOUNT APPARATUS AND ELECTRIC POWER SUPPLY SYSTEM

Examiner: Scully S.N.: 10/537,523 Art Unit: 1795

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 26, 2010 has been entered. Claim 13 is amended, claims 1-12 and 16-18 stand canceled and claims 21-24 remain withdrawn from consideration. Accordingly, claims 13-15, 19, 20 and 25-29 are pending examination.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claim rejections of claims 13-15, 19 and 27 under 35 U.S.C. 103(a) as being unpatentable over Gamo et al. (US5,976,725) in view of Zhang et al. (US2002/011335) are withdrawn in light of the Amendment.

4. Claims 13-15, 19 and 25-27 under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6,421,585) in view of Gamo et al. (US5,976,725) and Zhang et al. (US2002/011335) are withdrawn in light of the Amendment.

5. Claim rejections of claims 20, 28 and 29 under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6,421,585) in view of Gamo et al. (US5,976,725), Zhang et al. (US2002/011335) and Roth (US6522096) are withdrawn in light of the Amendment.

6. Claims 13-15, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gamo et al. (US5,976,725) in view of Zhang et al. (US2002/011335) and Ovshinsky et al. (US2003/0129459).

With respect to claims 13-15 and 19, Gamo discloses a fuel cell mount apparatus comprising a fuel cell (1) capable of power generation by use of a fuel and air (Column 4, Lines 20-43) and an electronic apparatus having said fuel cell mounted thereon and being operated by electric power outputted from said fuel cell. A DC/DC converter (504) is used in common for said fuel cell and said electronic apparatus (Figure 22; Column 17, Lines 10-23). Gamo discloses the electronic apparatus has a plurality of drive sections requiring electric power: display (5011) and CPU (5012) and so on (Column 17, Lines 10-33). Gamo does not disclose a plurality of power generation sections.

However, it is well known in the fuel cell art to use more than one unit cell in series or parallel to increase the voltage or current, respectively, as taught by Zhang. Zhang discloses stacking a membrane electrode assembly in various combinations to

provide fuel cells with more or fewer reaction zones and membranes ([0043]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the plurality of power generation sections of the fuel cell stack of Zhang in the fuel cell of Gamo because Zhang teaches it provides the fuel cell with a higher voltage and/or current output.

Gamo is silent with regard to an electric power supply means for supplying electric power to a predetermined drive section of said plurality of drive sections.

Zhang discloses a fuel cell system for powering electronic devices used far below the surface of the water in downhole or subsea locations ([0037]). The art is analogous in that the fuel cell system of Zhang is used to power an electronic device. Zhang further discloses the system to have a hybrid power system comprising a fuel cell (802) and a battery (804) (Figure 14; [0078]). The fuel cell and rechargeable battery are "electrically connected to provide power across a load 806. ...When coupled with a battery (804), the fuel cell (802) does not need to generate the maximum power output required for a short duration peak load. This hybrid system (800) is particularly suitable for multiple level power consumption requirements where a majority of time an average base level power requirement is needed and a relatively small amount of time there is a short-term peak power load. The rechargeable batteries (804) can be charged by the fuel cell (802) during the average power consumption periods and can be used to boost the output power during the high power consumption periods.

"The hybrid system (800) may be able to reduce the size, weight and cost of the total power system by enabling a smaller fuel cell (802), in conjunction with a battery

(804), to provide a required power demand (806)." ([0078-0079]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the drive sections of Gamo with a hybrid system because Zhang teaches it provides a reduction in size, weight and cost of the total power system by enabling a smaller fuel cell, in conjunction with a battery, to provide a required power demand. Further, when a battery is coupled with a fuel cell, the fuel cell does not need to generate the maximum power output required for a short duration peak load, as taught by Zhang ([0078]). It would have been obvious to one of ordinary skill in the art at the time of the invention to couple a battery with the fuel cell and drive sections of Gamo because Zhang teaches it provides peak load requirements.

Further, the coupled battery above would provide peak load requirements to a drive section requiring the load due to a large load variation. The fuel cell would provide power to the drive sections including those not supplied by the coupled battery.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the power supplies separable, because it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Gamo et al. in view of Zhang et al. do not disclose the fuel cell not supplying electric power to the predetermined drive section. It is noted that Zhang et al. disclose that their battery can be recharged by the fuel cell (which is believed to be equivalent to Figure 2 of Ovshinsky et al.). See [0078]. Ovshinsky et al. disclose a hybrid fuel cell and rechargeable battery system for an electric vehicle. Figures 1 and 2 depict

schematics of the fuel cell/battery/motor system, where Figure 1 shows the fuel cell in series with the battery and Figure 2 shows the fuel cell in parallel with the battery. Ovshinsky et al. notes that in the parallel configuration, the vehicle can be powered by either the fuel cell or the battery, or both the fuel cell and the battery. See [0055-0058]. It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the system of Gamo et al. in view of Zhang et al. in a configuration as taught by Ovshinsky et al. so that the battery can be recharged and can supplement and/or provide full power for an vehicle's electric motor so that the system operates at a high efficiency.

With respect to claim 27, Gamo et al. disclose the fuel cell having a control portion. See Abstract. Gamo et al. further disclose the electronic apparatus having a control portion (5012). Gamo et al. do not disclose the controllers integrally together. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the controllers, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

7. Claims 13-15, 19 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6,421,585) in view of Gamo et al. (US5,976,725), Zhang et al. (US2002/011335) and Ovshinsky et al. (US2003/0129459).

With respect to claims 13-15 and 19, Takamura discloses an electronic apparatus 1 having a battery 21 mounted thereon and being operated by electric power outputted from said battery (Figure 1; Column 3, Lines 43-48).

Takamura does not disclose the power source to be a fuel cell.

Gamo discloses a fuel cell mount apparatus comprising a fuel cell 1 capable of power generation by use of a fuel and air (Column 4, Lines 20-43) and an electronic apparatus having said fuel cell mounted thereon and being operated by electric power outputted from said fuel cell. A DC/DC converter (504) is used in common for said fuel cell and said electronic apparatus (Figure 22; Column 17, Lines 10-23). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the fuel cell and DC/DC converter of Gamo as the power source system for the electronic apparatus of Takamura because Gamo teaches it provides an environmentally friendly power supply that can realize a small-sized and lightweight power source usable for a long time (Column 16, Line 66-Column 17, Line 2).

Takamura further discloses actuators (23A-23N) provided respectively at articulation joints of legs (4A-4D) and other joints. The actuators (23A-23N) are driven under control of electronic circuit installed within the body portion (3). The actuators are driven to produce movement of the electronic apparatus (Column 3, Lines 49-59). These actuators are a plurality of drive sections. It is appreciated that the power generation unit would supply power to the drive sections.

Takamura does not disclose a plurality of power generation sections.

However, it is well known in the fuel cell art to use more than one unit cell in series or parallel to increase the voltage or current, respectively, as taught by Zhang. Zhang discloses stacking a membrane electrode assembly in various combinations to provide fuel cells with more or fewer reaction zones and membranes ([0043]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the plurality of power generation sections of the fuel cell stack of Zhang in the fuel cell of Gamo because Zhang teaches it provides the fuel cell with a higher voltage and/or current output.

Takamura modified by Gamo is silent with regard to an electric power supply means for supplying electric power to a predetermined drive section of said plurality of drive sections.

Zhang discloses a fuel cell system for powering electronic devices used far below the surface of the water in downhole or subsea locations ([0037]). The art is analogous in that the fuel cell system of Zhang is used to power an electronic device. Zhang further discloses the system to have a hybrid power system comprising a fuel cell (802) and a battery (804) (Figure 14; [0078]). The fuel cell and rechargeable battery are "electrically connected to provide power across a load (806). ...When coupled with a battery (804), the fuel cell (802) does not need to generate the maximum power output required for a short duration peak load. This hybrid system (800) is particularly suitable for multiple level power consumption requirements where a majority of time an average base level power requirement is needed and a relatively small amount of time there is a short-term peak power load. The rechargeable batteries (804) can be charged by the

fuel cell (802) during the average power consumption periods and can be used to boost the output power during the high power consumption periods.

"The hybrid system (800) may be able to reduce the size, weight and cost of the total power system by enabling a smaller fuel cell (802), in conjunction with a battery (804), to provide a required power demand (806)." ([0078-0079]). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the drive sections of Takamura with the hybrid power system of Zhang because Zhang teaches it provides reduction in size, weight and cost of the total power system by enabling a smaller fuel cell, in conjunction with a battery, to provide a required power demand.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the power supplies separable, because it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Takamura in view of Gamo et al. and Zhang et al. do not disclose the fuel cell not supplying electric power to the predetermined drive section. It is noted that Zhang et al. disclose that their battery can be recharged by the fuel cell (which is believed to be equivalent to Figure 2 of Ovshinsky et al.). See [0078]. Ovshinsky et al. disclose a hybrid fuel cell and rechargeable battery system for an electric vehicle. Figures 1 and 2 depict schematics of the fuel cell/battery/motor system, where Figure 1 shows the fuel cell in series with the battery and Figure 2 shows the fuel cell in parallel with the battery. Ovshinsky et al. notes that in the parallel configuration, the vehicle can be powered by either the fuel cell or the battery, or both the fuel cell and the battery. See [0055-0058].

It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the system of Takamura in view of Gamo et al. and Zhang et al. in a configuration as taught by Ovshinsky et al. so that the battery can be recharged and can supplement and/or provide full power for an vehicle's electric motor so that the system operates at a high efficiency.

With respect to claims 25 and 26, Takamura discloses the electronic apparatus is a dog robot where the drive sections are motors (23A-23N) individually mounted to each of the joint portions for joint movement. See Column 3, Lines 49-59.

With respect to claim 27, Takamura in view of Gamo et al. and Zhang disclose the fuel cell having a control portion. See Abstract of Gamo et al.. Takamura further discloses the electronic apparatus having a plurality of control devices. See Abstract of Takamura. Takamura in view of Gamo et al. and Zhang do not disclose the controllers integrally together. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the controllers, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

8. Claims 20, 28 and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura (US6,421,585) in view of Gamo et al. (US5,976,725), Zhang et al. (US2002/011335) and Ovshinsky et al. (US2003/0129459) as applied to claims 13-15, 19 and 25-27 above, and further in view of Roth (US6522096).

With respect to claims 20 and 28, Takamura does not disclose the electronic apparatus having a plurality of drive sections and said fuel cell has the same number of power generation sections as the number of said plurality, said power generation sections disposed respectively in the vicinity of said drive sections, and said drive sections are supplied with electric power respectively from the corresponding power generation sections.

Roth discloses a control circuit for a robot power supply. As discussed by Roth, a single power supply is disadvantageous in that high cabling expenditure is involved. Also, electromagnetic and line-linked disturbances or interference cannot be excluded and must be considered. Further, high costs are involved for cooling and safety assurance (Column 1, Lines 19-43). In addressing these problems, each motor of an installation having several motors is provided with its own driver unit. As a result of the subdivided design of the power supply through the use of individual driver units for each motor, it is possible to position the individual driver units close to the mechanism, and in particular close to the individual motors associated therewith. This results in minimum cabling costs as well as significant reduction in electromagnetic and line-linked interference. Further, the costs for cooling and assuring the necessary safety are kept low (Column 1, Lines 45-67). It is noted that the power supply device is the modular drivers 4.1-4.6 for each motor 1.1-1.6 (Figure 1; Column 4, Lines 29-31). In the case of Roth, the plurality of drive sections are the motors 1.1-1.6 and the same number of power generation sections are the drive units 4.1-4.6.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a plurality of drive sections with a plurality of power generation sections disposed in the vicinity of said drive sections for supplying electric power respectively from the corresponding power generation sections to the drive sections because Ross teaches it reduces cabling expenditure, electromagnet and line-linked disturbances or interference and costs for cooling and safety assurance as discussed above (Column 1, Lines 19-67).

With respect to claim 29, the power generation devices would obviously have as many unit cells as necessary to supply the proper level of voltage and current for the drive sections to operate.

Response to Arguments

9. Applicant's arguments with respect to claims 13-15, 19, 20 and 25-29 have been considered but are moot in view of the new ground(s) of rejection.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795